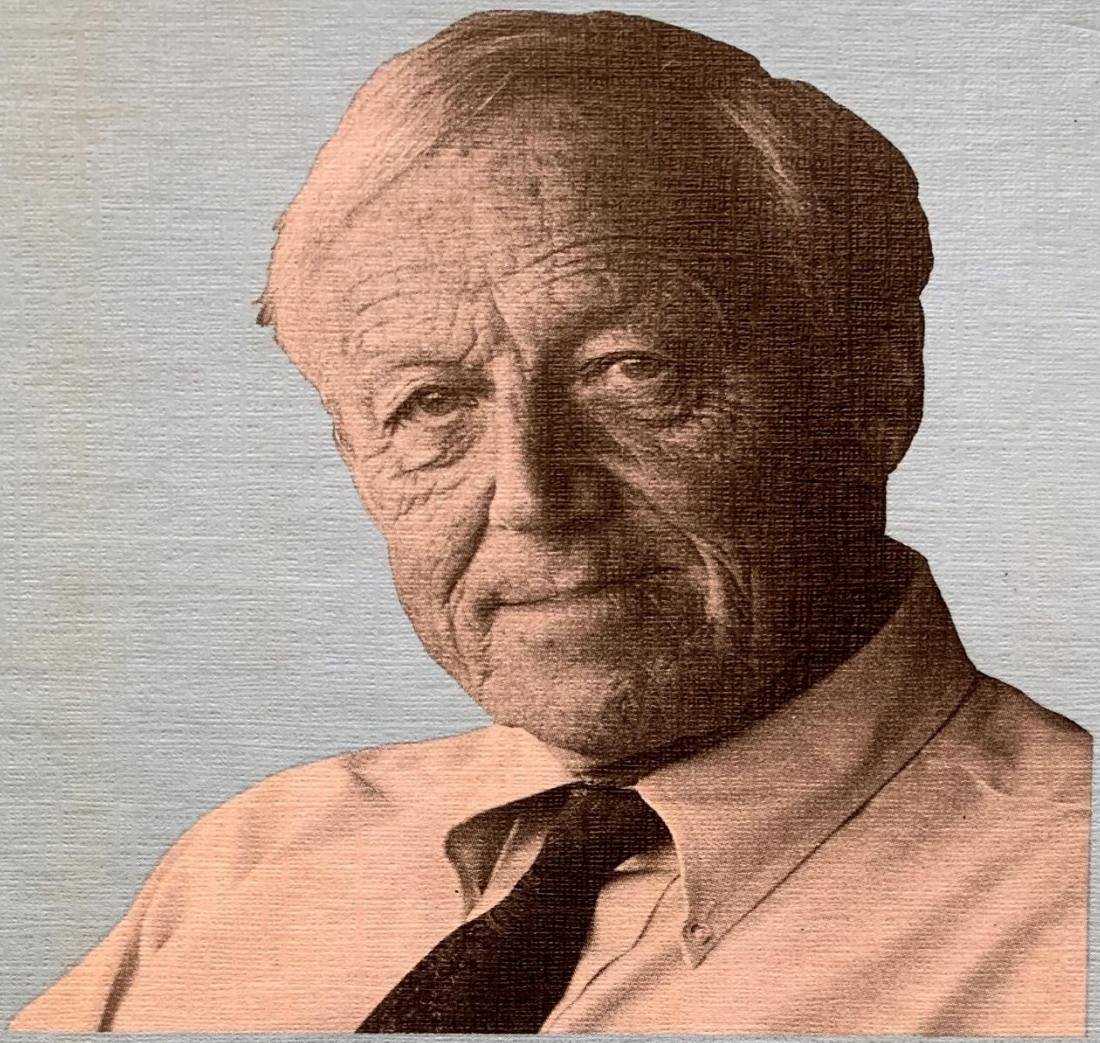

PLASMA AND THE UNIVERSE

DEDICATED TO HANNES ALFVÉN

PLASMA AND THE UNIVERSE

Dedicated to Professor Hannes Alfvén on the Occasion of His 80th Birthday, 30 May 1988

Guest Editors

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SPECIAL ISSUE DEDICATED TO PROFESSOR HANNES ALFVÉN ON THE OCCASION OF HIS 80TH BIRTHDAY, 30 MAY 1988

Guest Editors

CARL-GUNNE FÄLTHAMMAR, GUSTAF ARRHENIUS, BIBHAS R. DE, NICOLAI HERLOFSON, D. ASOKA MENDIS, and ZDENĚK KOPAL

HANNES ALFVÉN AT EIGHTY

Ten years ago, *Astrophysics and Space Science* dedicated its May issue to Professor Hannes Alfvén on the occasion of his seventieth birthday. Time has now come to honour him on his eightieth birthday by publishing this special issue of *Astrophysics and Space Science*.

The preface of the May 1978 issue outlined his life and work until then. In the decade that has passed since that time, the outstanding significance of his pioneering work has become even more evident. The waves that he discovered long ago are of fundamental importance to the whole field of plasma physics, in the laboratory as well as in space. Likewise, the concept of gyrocentre drift and the perturbation theory based on it are powerful tools for studying charged particle motion, and are being widely used and developed to ever higher sophistication. The critical velocity phenomenon in the interaction of a plasma and a neutral gas, which was proposed by Alfvén with amazing intuition – subsequently observed experimentally and only much later explained by theoreticians – has attracted sharply increased interest in recent years, following its observation in space.

The latest decade has not only verified the importance of Alfvén's past work, it has also been a decade in which he has continued a very active scientific life with new contributions to science especially in the field of cosmogony. For example, he has made use of the latest data from the Voyager spacecraft to test, with remarkable success, his theoretical predictions about the detailed structure of the Saturnian rings.

Hannes Alfvén is, in the true sense of the words, a pioneer and an explorer who has opened new vistas in science. His early contributions earned him the Nobel Prize for Physics in 1970. These contributions date back to the 1940's and were at that time highly controversial and largely ignored by the scientific community. Much later the progress of experiments and observations have proved his ideas to be right.

However, Hannes Alfvén never rests on his laurels. In recent years his mind has turned to the 'Plasma Universe', ranging in space from the Earth's own neighbourhood throughout the dephts of the Cosmos, and in time to the events in the past that led to the formation of the solar system. Some of his concepts about the Plasma Universe are

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already receiving observational support. Others are still controversial, but, given the record of his previous contributions, one may well find them to be validated by future observations.

Not only has he contributed to science by his own work, but Hannes Alfvén has also inspired a generation of young scientists worldwide. Everybody, including his critics, agrees that he is a fascinating and inspiring speaker. Especially in the last few years, his invited talks at major international conferences have been exceptionally well received.

Most remarkably, at eighty Hannes Alfvén remains vigorously active both in his profession and in human affairs. We and his many other friends worldwide hope that for many years to come we shall have the privilege of his collaboration, his inspiration, and his contributions to science.

Gustaf Arrhenius
Bibhas R. De
Carl-Gunne Fälthammar
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Zdenek Kopal
D. Asoka Mendis